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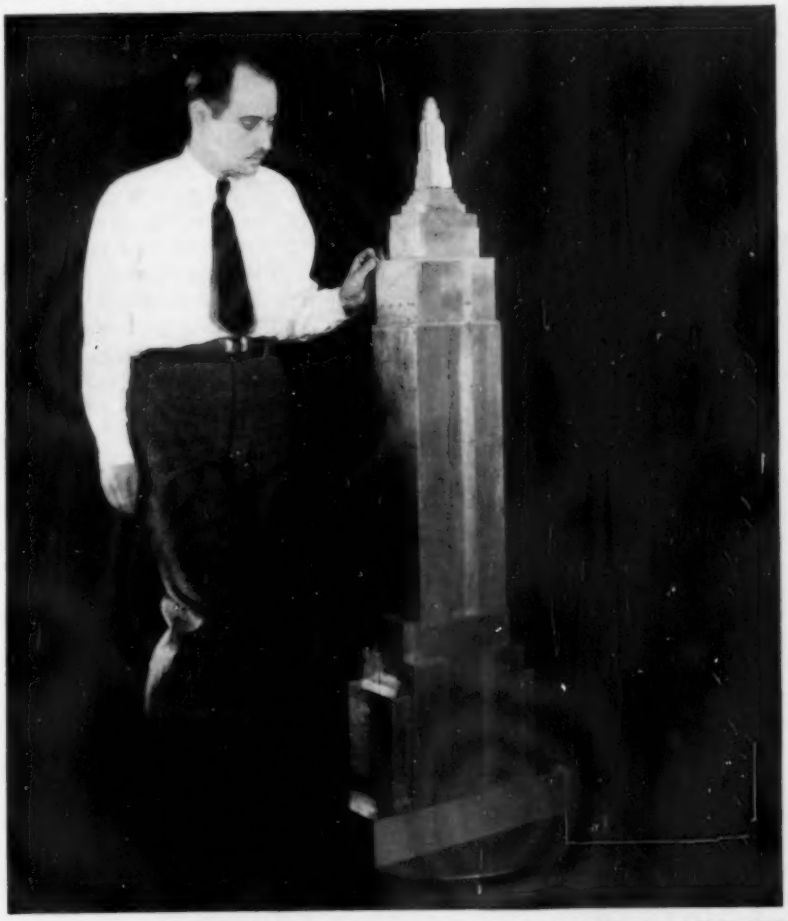
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



NOVEMBER 14, 1931

Overshadowing the Tallest Skyscraper

See Page 316

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SCIENCE NEWS LETTER

VOL. XX *No. 553*

The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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? DO YOU KNOW THAT ?

Turning out a loaf of bread in 12 minutes was recently achieved in a demonstration.

Peanut shells as a source of artificial silk are being investigated by the U. S. Department of Agriculture.

When a bullfrog swims, it draws its bulging eyes back into their sockets for their protection.

London now has an official who decides each day how much fresh air should be admitted to street cars, and the windows are locked in that position for the day.

In one of New York's newest hotels, guests are protected from vibration by lead-asbestos anti-vibration pads under each of the column footings of the building.

City ordinances limiting height of office buildings are commonplace these days, but Honolulu has an unusual rule: grass huts, used by business firms to capture the old-time native atmosphere, must not exceed 600 square feet in area.

A temperature of approximately freezing, or a degree or two below, is best for keeping stored apples.

Rocks or rock mixtures are found to have possibilities as raw material for the manufacture of rock wool, an effective insulating material.

There are 32,000,000 persons in the United States who drive automobiles, of which number 22,000,000 have taken no test of driving ability.

The birth rate per 1,000 population for the registration areas of the United States has declined from about 24 in 1921 to less than 19.

A European fad, similar to the more familiar keeping of goldfish in an aquarium, is to have a cage containing frogs and lizards, says Karl P. Schmidt, of the Field Museum.

Viewing motion pictures causes less eye strain than reading a book for a similar length of time, says an officer of the National Society for the Prevention of Blindness.

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Science Service presents over the radio, an address

THE UNITY OF LIFE

By Dr. C. E. McClung, professor of zoology at the University of Pennsylvania and prominent cytologist.

Friday, November 20, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

EMBRYOLOGY

Late Division of Embryo Causes Differences in Twins

Theory of Chicago Zoologist Would Explain Why Some Pairs are Really Identical and Others Unlike

CONJOINED TWINS have been regarded by scientists as unquestionably of the type in which each pair has a single origin in one egg cell or ovum —identical twins, the biologist calls them. And yet they are far from identical.

The answer to this disconcerting puzzle is given in the theory of how twins are formed propounded by Dr. H. H. Newman of the University of Chicago in a report to the American Genetic Association, published in the *Journal of Heredity*.

Dr. Newman has been making a special study of the likenesses and differences of twins in appearance as well as in other physical respects. He has found some identical twins which are so much alike that they cannot easily be distinguished one from the other, and other pairs so little alike that their faces might belong to entirely unrelated persons. Strangely enough, the conjoined, or Siamese, twins fall at the unlike end of this resemblance scale.

Heads Not Same Size

As examples, Dr. Newman cites the Hilton twins, famous in vaudeville. One of these sisters has a much larger head than the other and she is an inch and a half taller. Their associates constantly emphasize their temperamental differences. Of the Godena twins, Simplicio and Lucio, Filipinos, also in vaudeville in the United States, one member is larger than the other. Their heads are of a decidedly different shape—one having a sloping forehead, the other a more vertical brow. This unlikeness of two beings so nearly one person that they have indeed no separate existence is due to the fact that for too long a time they were one undivided person, Dr. Newman believes.

Separate identical twins are formed by the separation into two parts of an embryonic cell mass derived from a single fertilized egg cell. What would have developed into the left half of the single person doubles itself and becomes a whole person.

At a certain stage in its development, the egg cell mass begins to develop a right and a left side. These are like each other, but like the mirror reflection of each other rather than an exact duplication. In the same way, your right hand is not exactly like your left, but like its image in a mirror.

If the separation which makes the twins takes place before this stage at which asymmetry develops, it is indicated by Dr. Newman's report that the two resulting individuals are likely to be almost exact duplicates of each other —more alike than the left side of your face is like the right side.

If, however, the separation takes place after the asymmetry becomes established, the resulting twins are more likely to appear as mirror images of each other. One may be right-handed and the other left-handed. The hair of one will grow in the opposite direction from that naturally taken by the hair of the other. The finger or palm prints of the left twin are likely to be reversed.

But this imaging is never perfect even in the two sides of a single individual. If you examine yourself or your friends very carefully you will find slight or perhaps marked differences between the right and left side of the face, between the left hand and the right hand, or the left foot and the right foot. Photographers recognize this and select the "best" side of the face for a portrait. It is said that Edison was commonly photographed from only one side because that side of his face better displayed his character as known to his associates. Shoe dealers find it advisable to try on both right and left shoes, for one foot is often larger than the other.

So, careful examination may detect differences in these mirror image twins that will enable parents and friends to know them apart.

Finally, if twinning comes too late to permit the complete separation of the two body halves, double monsters may be formed in which the two parts are complete reversals of each other. The left part can produce only left characters.

"Both sides of the face of the right twin will be like the prospective right side of the face of the single individual; and similarly both sides of the face of the left twin will be left faces," Dr. Newman tells us. "No wonder, then, that the faces of conjoined twins are usually so different!"

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PHYSICS

New Scientific Council To Standardize Colors

A CLEARING house of reliable information on color for artists, scientists and industrialists, is being organized by thirteen cooperating scientific and technical societies.

The new Inter-Society Color Council, whose chairman is Prof. E. M. Gathercoal of the University of Illinois, will standardize the names, measurements and specifications of colors. Practical men confronted with color problems will, according to the plans of the council, be put immediately in touch with those who have appropriate technical knowledge. Duplication of effort and loss of time will thus be avoided.

At present there is a gap between those who have the scientific knowledge of color, such as physicists of the Optical Society of America or textile chem-

Jr. of Heredity

TWO KINDS

Conjoined or "Siamese" twins from the Philippines, and their wives who are separate identical twins. Notice how the Siamese twins differ in height and facial expression.

ists, and those artists, painters and illuminating engineers faced with practical problems in the use of colors. The color council, made up of delegates from the constituent societies, and of private persons interested in the same program, will set about filling this gap.

At the same time the council will, by the spread of popularized information, promote a wider understanding of color problems.

Other officers of the new organization are: vice chairman, L. A. Jones of the staff of the Eastman Kodak Company and president of the Optical Society of America; secretary, M. Rea Paul of the National Lead Company; treasurer, A. E. O. Munsell, president of the Munsell Research Laboratories, Baltimore.

The cooperating bodies are as follows: American Association of Textile Chemists and Colorists, American Chemical Society, American Oil Chemists' Society, American Pharmaceutical Association, American Society for Testing Materials, Illuminating Engineering Society, International Society of Master Painters and Decorators, National Academy of Design, N. Y. Museum of Science and Industry, Optical Society of America, Technical Association of the Pulp and Paper Industries, Textile Color Card Association of the U. S., and the U. S. Pharmacopeia.

Science News Letter, November 14, 1931

PHYSIOLOGY

Enzyme in Liver Makes Vitamin A from Carotene

AN ENZYME has been found in liver which transforms carotene, the yellow coloring matter of carrots, into vitamin A, Harold S. Olcott and Duane C. McCann of the State University of Iowa have just discovered.

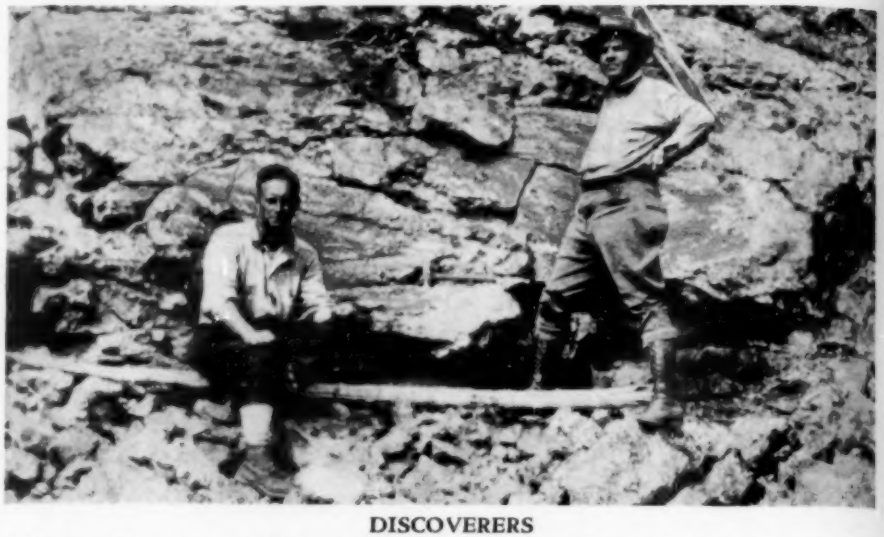
The fact that carotene, which is found in other vegetables besides carrots, was changed to vitamin A in the body has been known to scientists for some time. The transformation has never before been performed outside the body, however.

Preliminary experiments showed that carotene was destroyed and vitamin A appeared when carotene was kept in a warm place for a time with fresh liver tissue from the bodies of rats that had lacked vitamin A. It was supposed that the reaction was due to an enzyme.

Further research, using a liver extract instead of fresh liver, proved this to be the case, the Iowa investigators report.

They suggested that the new enzyme should be called carotenase.

Science News Letter, November 14, 1931



DISCOVERERS

Gilbert LaBine, left, and Shirley R. Cragg, the mining engineers who used an airplane to locate the radium ore veins

METALLURGY

New Radium Find in Canada May Break Belgian Monopoly

THAT RADIUM to the value of several millions of dollars, just discovered in Canada, will break the Belgian world monopoly of this precious substance and speed up the relief of cancer victims is the opinion of competent mining experts in Washington.

The pitchblende treasure bearing $7,000 worth of radium in every ton of ore, discovered by Gilbert LaBine and Shirley R. Cragg, airplane prospectors, of the El Dorado Mines Corporation at Labine Point in the Great Bear Lake region, is equal in richness to the best ores of the Belgian Congo, which since 1922 have driven all competitors, including the United States, from the market.

The new ore is here described by geologists as "a very substantial deposit of high grade material" yielding one three-hundredth of an ounce of radium per ton. Twenty tons have already been shipped on a fur steamer of the Mackenzie river and forty more tons mined ready for shipment at a cost which compares favorably with Belgian freight charges on the long passage from Africa to the refineries in Europe.

Hundred-pound lumps were actually picked up on the surface. The radium from these will yield $70,000 a gram whereas the most valuable emeralds fetch only $5,000 a gram. Silver ore yielding $300 a ton has been found alongside.

The Canadian discovery, consisting apparently of several thousand tons of ore, will add greatly to the world's present 600 gram total supply of radium. Treatment of cancer, until now hindered by the prohibitive prices, will be helped.

Science News Letter, November 14, 1931

METEOROLOGY

Egyptian "Dust Devils" Reported to be Orthodox

"DUST-DEVILS" of Egypt which seemed to have defied the world-wide rule that such upward moving columns of air whirl in a direction opposite to the hands of clocks, have had their non-conformity exorcised by J. Durward, weather observer at Heliopolis. Some of these little tornadoes rise only two feet above ground, carrying with them leaves and feathers.

Mr. Durward, in writing a letter to *Nature,* reported a study of the dust-devils and suggested that reports of clockwise rotation are due to the spectator forgetting that he is looking down on the little cyclone and not up.

Science News Letter, November 14, 1931

ARCHAEOLOGY

Valuable Objects Found in Cemetery of Unknown Race

Mortuary Equipment and Remains of People Dead 4000 Years Yielded by Great Necropolis Unearthed in Persia

A GREAT cemetery containing the remains and the treasured possessions of an unknown, ancient people has been unearthed in Persia. The announcement was made by Horace H. F. Jayne, director of the Museum of the University of Pennsylvania, upon receipt of a cable from the joint Persian expedition of the Museum and the Pennsylvania Museum of Art.

The cemetery was discovered by the expedition working at Tepe Hissar, a few miles from Damghan, Peria. Scores of graves have been opened, revealing the remains of a people some 4,000 years old. Their racial origin is unknown, but it is possible that they form a connecting link between India and Mesopotamia.

The report, made by Dr. Erich Schmidt, field director of the expedition, describes the cemetery as it appears after weeks of careful excavation:

"It is an awe-inspiring sight to look upon the remains of a hundred people, dead ages ago, exposed with their mortuary equipment to the sunlight, in one great necropolis. Thus we found them in the main mound at Tepe Hissar. Altogether about two hundred graves of the last Tepe Hissar people have been unearthed to date, and one can imagine the wealth of information and the beautiful objects derived from them.

"There were remains of little children with their miniature dishes, as well as those of men and women, with cups, bowls, and pitchers of the attractive gray ware of the period. Many were found with strings of beads still attached to their necks, and bracelets, anklets and finger rings of copper clinging to their bones.

"One of the most interesting discoveries was a little girl's grave. There had been buried with her lapis lazuli beads, gold ear pendants, onyx beads, and some small figurines carved in the shape of cow and sheep. Some plain silver pins and six little silver cups completed the child's equipment for the other world.

"In one of the graves were found the remains of a warrior, dead almost 4,000 years. Beside him were his weapons—a bident, a dagger, a battle-ax and a helmet. A silver pitcher, covered with purplish gray patina that is acquired with age, lay close to the head, and the left hand held two gold-coated rings and a string of lapis lazuli and onyx beads.

"The results of the first few months' work are of an intensely interesting and important nature. The dead of Tepe Hissar and their mortuary equipment illuminate an entirely new and fascinating phase of human culture in this region of the world."

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ENGINEERING

Engineers Would Build Homes Out of Steel

AMERICANS would be building their homes—even the vine-covered bungalows for two—out of steel instead of the now conventional wood, brick, stone and plaster, if the engineers who met at White Sulphur Springs, W. Va., had their way.

And beautiful, convenient, economical houses they would be, according to a description given by T. J. Foster of New York. Mr. Foster has studied the methods of construction of experimental private residences built from time to time in which steel has been substituted for more common building materials.

In an address before the American Institute of Steel Construction he described the building that he concludes from his study will make the most desirable steel private residence.

Mr. Foster's plan is not merely an adaptation of skyscraper methods of construction to the private home. Following research to perfect details, he would manufacture sections of walls and of floors, and pieces of the frame for the house in a central shop.

Instead of seeing his home rise gradually, step by step, the owner of a steel residence would watch the structure swung boldly and rapidly into place with a stiff leg derrick. Mr. Foster estimates that a home built in this fashion would cost less than an equivalent one as erected now.

The basic wall material suggested is a steel slab, backed with an insulating material, to be made in the shop and fastened to the steel frame at the site. It is claimed that such a slab has greater insulating value than ordinary materials, making the house warm in winter and cool in summer. It will not shrink, harbor vermin or burn, Mr. Foster declared. For the roof, the same type of slab would be used.

Even the chimney would be built in the shop in three lengths and set in place with a derrick.

Science News Letter, November 14, 1931

DIGGERS AT WORK

Excavating the ancient cemetery. Two hundred of the graves have been uncovered.

MEDICINE

Outwitting Climate

Health Handicaps Resulting from Immigration Between Tropics and Northern Countries have been Overcome

HARKING BACK to the old Bible story of Noah dividing the earth between his sons, the belief has long prevailed that every human being is born to live in a particular corner of the globe and woe to him if he tries to exchange his birthright.

Blond descendants of the northern races came to conquer the tropics and were conquered by them, stories tell.

Dark-skinned sons of the bright lands languished when they rashly attempted to invade a cold, dark north, other chronicles relate.

Nor do eminent ethnological and medical authorities wholly refute this ancient belief that the color of the skin is in some way linked to the climate and that a brunet might thrive in a climate where a blond would die.

Science today is lifting the ban on migration from the tropics to temperate regions or from the dark, cold lands to the bright, hot countries. For though no means has yet been discovered to control the climate outdoors or regulate the amount of sun that will shine any day, any place, man is learning to adjust himself artificially to the weather, and indoors he can make weather to suit his taste.

Cloudy, Cold Climates

How cloudy, cold climates can be made safe for dark-skinned children, who otherwise are likely to be stunted or die in alien surroundings, has been strikingly proved in a recent experiment conducted by the Children's Bureau of the U. S. Department of Labor in New Haven, Conn.

Rickets, a deforming disease of the bones, is extremely prevalent in dark, cloudy climates, due to a deficiency of sunlight. Italian and other dark-skinned children have been found to be the worst sufferers from this maiming disease in our northern cities. Requiring more sun for health, brunets suffer more than blonds from dark winters.

Protection afforded by heated apartments and warm clothing is not alone sufficient to safeguard children of the warm countries from the stern northern climate. A high mortality rate exists among families emigrated from southern European countries to northern cities and among Negro children whose ancestors were imported from the tropics not many generations ago. Unsanitary conditions and low living standards prevailing in many tenement sections might in a measure account for this fact, but they do not explain the greater hardihood of fair-skinned immigrants living in the same surroundings.

Modern researches have proved, however, that even dark-skinned babies can be protected against rickets and many other dangers of the dark, dreary winter months, if all the available sunshine is put to good use and various artificial "substitutes" for sunlight supplement the supply provided by nature.

Ultraviolet ray lamps have been made and used successfully to compensate for a deficiency of natural sunlight in the treatment of rickets, while cod-liver oil and a number of substances irradiated by ultraviolet light have been found to have a similar effect. For centuries cod-liver oil has been recognized as a good medicine for children but only recently has it been known that it contains vitamin D, the same vitamin that is formed in the skin by the action of the sun's rays. Vitamin D is essential to normal growth of the bones.

Although individual cases have been saved from rickets by various methods for a number of years, the practical possibility of preventing rickets among whole communities and races of people in northern communities had not been proved when the New Haven experiment was undertaken.

A section of New Haven, where there were living both southern European and Negro families, was selected for the study because of the susceptibility of dark-skinned babies to rickets. Whenever a baby was born, a nurse from the Children's Bureau clinic visited the home and explained the treatments.

"With the baby lying across her lap, the mother pours out the proper dose of cod-liver oil, holding the spoon in her right hand. With her left hand she holds the baby's mouth open by pressing the cheeks together between her thumb and fingers. The oil may then be poured little by little into the baby's mouth. If his mouth is not held open until the oil entirely disappears, the baby will spit out what is left," reports Dr. Martha M. Eliot, director of the child hygiene division of the Children's Bureau, who supervised the New Haven experiment.

In Every-day Diet

Cod-liver oil is a food, supplying elements for normal growth, and belongs in the every-day diet of babies—not on the medicine shelf for occasional doses, the mothers were told. It may be safely omitted only during the hot summer months, when babies are receiving long sun baths, and daily doses should be started by the first of September and continued throughout the winter.

Making every day of sunshine count for the health of the babies, the directions to mothers prescribed outdoor sunbaths for the babies from March until November. Even the sun of bright winter mornings was put to work, infants in scanty clothing being placed before open windows so that the ultraviolet radiations from the sun would have free access to their bodies.

Monthly examinations of the babies subject to these treatments over a period of three years revealed that only 27 out of the 480 babies born in the community during that time developed moderate or severe cases of rickets; and

TAKING NO CHANCES

Physical examinations are a sure means of keeping tab on the baby's condition, and susceptibility to rickets.

in all 27 cases the mothers had failed to follow the nurse's instructions.

X-ray pictures of the children's bones revealed that many at one time or another were on the verge of contracting rickets but the symptoms were quickly outgrown and apparently had no harmful effects. Left untreated, the disease might have had serious results.

Despite the susceptibility of brunet children to rickets in our northern cities, further investigation by the Children's Bureau revealed that dark native children of Porto Rico practically never suffer from the malady on their own sunny island.

Six hundred Porto Rican children were examined by Dr. Eliot. Out of this number only two showed traces of rickets and one of these had been kept hidden away from the sun in a dark cellar and the other child had spent part of its life in the North.

Bright sunshine of the islands, and the open houses, without glass to keep out the ultraviolet radiation of sunlight, apparently prevent rickets among even extremely dark children. So in moving northward into a region of colder, darker winters, brunet peoples would incur a real danger, except for the modern discovery of treatments whereby dark-skinned babies may be adjusted to a climate with little sunlight.

Modern Weapons

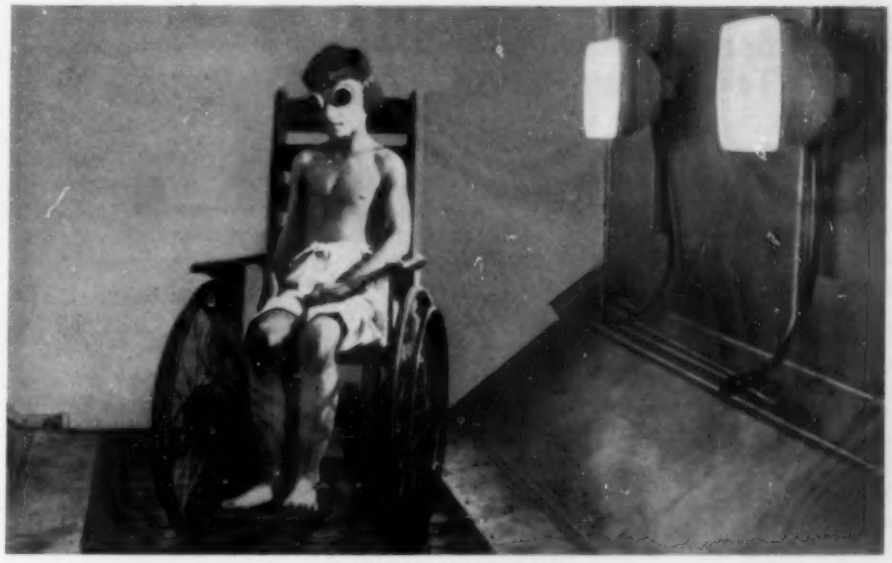
Primitive men, without clothing, shelter or even fire, could not have existed outside the tropics, most ethnologists believe. But slow centuries of evolution and experience have gradually fitted man to withstand harsh but stimulating winters; and cod-liver oil and ultraviolet lamps furnish another weapon.

Today when the blond races go to the tropical countries, however, they often have difficulty in adjusting themselves to the heat and sunlight which is natural and tolerable to natives.

Some authorities still believe that the white man cannot adjust himself to a torrid climate and that continued residence in the tropics has an inevitably deteriorating effect.

Poor sanitary conditions, favoring the spread of disease, exist in many tropical regions and are largely responsible for the bad name which the tropics have, other investigators believe.

While admitting that the torrid climate presents a barrier to white colonization of the tropics, another group holds that this handicap can be largely overcome by the weapons of modern science.



ULTRAVIOLET RAYS

Make up for the lack of sun, a hardship which an alien climate imposes upon a child.

Seasonal or even daily changes of residence were recently suggested as a means of lessening the insidious influence of tropical climate on the white man by Dr. Bowman C. Crowell of Jefferson Medical College. The productiveness of the warm countries is so great that it might be economically feasible to provide for the cooling of houses, Dr. Crowell believes.

"Scientific investigations have not shown, however, that climate is any insuperable barrier to the white man's successful continued life in the tropics."

Even more optimistic concerning the fate of the fair races in the tropics is Col. Weston P. Chamberlain. His opinion is based on his experience with the Medical Department of the United States Army in Panama.

"The greater part of the sickness and death formerly attributed to malign influences exerted by the tropical climate was actually due to infections which are now almost entirely preventable," said Col. Chamberlain.

In proof of his contention, Col. Chamberlain cites the improvement in health conditions in the Canal Zone during the past 25 years.

Before the Americans were given sanitary control over the zone, malaria, yellow fever, dysentery, typhoid, smallpox, uncinariasis and skin affections were endemic. Indeed, the failure of the French to make a canal across the Isthmus where the Americans were later successful has been blamed on unhealthful tropical conditions. It has been estimated that between 1881 and 1889, at least 16,000 employees died from all causes. This mortality occurred in a force which averaged only a little over 10,000.

In 1904, the United States bought the property of the French company and was given unrestricted sanitary control over the zone, including the Panamanian cities of Colon and Panama.

Much less was then known about tropical medicine that is known today. Yellow fever and malaria were, however, the two worst scourges on the Isthmus and medical research during the preceding decade had revealed that these dangerous diseases are spread by the mosquito.

Yellow Fever Gone

As a result of strenuous measures for mosquito control, which involved the establishment of a water system and the abolition of cisterns, tanks, rain barrels, roof gutters, and similar breeding places, yellow fever soon disappeared. The last case to develop locally occurred in Colon on May 17, 1906.

Control of malaria has been more difficult and expensive, because conditions of Panama are particularly favorable to breeding the malaria mosquito. Because of the expense, the anti-malaria efforts have been confined to the large towns where the white population is concentrated, and native farmers are required to live at least one mile beyond the borders of the sanitated towns.

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ARCHAEOLOGY

Ancient Shawls Pass Modern Textile Tests

SHAWLS made for fastidious Egyptian royalty as far back as 1400 B. C. have been put to modern tests at the Philadelphia Textile School, and it appears that broadcloth was known and appreciated even in that early time.

For use in the tests, the Metropolitan Museum of Art contributed eight little squares of cloth from Egyptian tombs of three different periods of history. One fragment was cut from a sheet or shawl in the burial of Queen Meryet-Amun, who lived in Egypt about 1400 B. C. Five more squares came from the burial garments of the little old Princess Entiu-ny who lived about 1000 B. C. Two samples were from shawls worn in the Roman period of Egypt, about the second century A. D.

The tests made by Bradley C. Alego and Howard A. Walter show that the modern broadcloth texture was used in Egyptian cloth of all three periods. The majority of the samples were of this weave, which consists of using twice as many warp as filling threads per inch. The fragments of cloth are cited as evidence that "even so many centuries ago people recognized the wearing qualities and fast weaving possibilities of this texture."

Microscopic studies of the fibers in the cloth showed that every piece was made of flax.

Science News Letter, November 14, 1931

VITAL STATISTICS

Health Record for 1931 In Spite of Depression

IN SPITE of economic depression and an influenza outbreak during the early part of the year the deathrate for the United States and Canada will probably be lower for 1931 than ever before, statisticians of the Metropolitan Life Insurance Company predict from their study of the company's records of deaths among the industrial population during the first nine months of the year.

"Regardless, however, of whether a new low point in the deathrate is actually reached, the 1931 health record to date is in many respects the most remarkable of all the years," the company reports.

The records of the company showed that deaths for the first three quarters of this year are only three-quarters of one per cent. higher than last year's all-time record minimum deathrate.

The deathrate for tuberculosis dropped seven and one-half per cent. If this continues to the end of the year, the largest year-to-year decrease registered for this disease in ten years will be recorded.

The diphtheria deathrate also dropped to a new low of 3.9 per 100,000 which is one-seventh of the rate twenty years ago. New low deathrates for the year are also expected for typhoid fever, diarrheal conditions and conditions associated with childbirth.

Another unusual feature for the year's health picture so far is that there has been no rise in the pneumonia deathrate in spite of the influenza outbreak and high mortality from that disease.

The diseases which showed important increases during the first nine months of the year besides influenza are cancer, diabetes and infantile paralysis. The influenza deathrate returned to normal after last winter's epidemic was over.

Science News Letter, November 14, 1931

GEOLOGY

Glacial Diamonds Found In American Gravels

A NUMBER of diamonds have been found in gravel deposits in Michigan, Wisconsin, and Illinois. While the majority of them are small, many diamonds of considerable value have been discovered. The largest so far reported found weighed 21½ carats.

A great diamond field somewhere in the north is believed to be the source of these stray diamonds. Where it is—or was—no one knows. But undoubtedly at some time glaciers swept over it, carrying away with them some of the diamonds, and perhaps even sweeping away the entire deposit. As they moved down over the Great Lakes region they scattered the diamonds among the gravel they left in their wake. Attempts made to find this field have all failed. Probably if still in existence it is hidden in the great wild and inaccessible areas of Canada, and the search for it is on a par with the hunt for the proverbial needle in the haystack.

The diamonds found in the gravel beds, having been washed by water, are clean and easily seen. They resemble pieces of glass or clear crystal quartz. Usually they will reflect a rainbow of color without polishing. Therefore pebbles showing rainbow colors are worth examining carefully.

Science News Letter, November 14, 1931

IN SCIENC

ASTRONOMY

Astronomers Watch Return Of Comet in Saturn 'Family'

THOUGH so faint that it can only be glimpsed in the very largest telescopes, Neujmin's comet, first observed in 1913 and now on its first return to the neighborhood of the earth, is being carefully watched by astronomers. It is a great rarity, for it is a member of Saturn's "family" of comets, and the second one to be seen more than once.

According to the "capture" theory, the larger planets, Jupiter, Saturn, Uranus and Neptune, have captured comets as they were moving through space. That is, as the comets came within the gravitational attractions of these bodies, they were pulled inwards enough to make them part of the solar system. They still show the identity of their captor by making a close approach to the orbit of that body on each of their trips around the sun.

Science News Letter, November 14, 1931

ENGINEERING

Cars of Future Will Need Better Lubricants

AUTOMOBILES will soon have such great speed and acceleration that special extreme-pressure lubricants not now available to the public will be needed to keep their transmission and differential gears from scoring and breaking down under the strain to which they will be put.

This is the suggestion of H. C. Mougey and J. O. Almen, engineers of the General Motors Corporation, made before the American Petroleum Institute meeting at Chicago. They pointed out that even now the generally accepted theory of lubrication does not hold for some parts of the automobile.

It is widely thought that in lubrication a film of oil actually prevents rubbing surfaces from coming together, the engineers said. But, they declared, this condition does not apply to highly loaded gears which make contact at fast rubbing speeds as in the transmission and differential of an automobile.

Science News Letter, November 14, 1931

NCE FIELDS

CHEMISTRY

Thin Chromium Coatings Protect Army Rifles

VERY THIN coatings of chromium, bluish-white non-tarnishing metal used on auto trim and plumbing fixtures to keep them shiny, are being applied to the interiors of Uncle Sam's large and small caliber guns to keep them from rusting and to give them longer life, Dr. William Blum, Bureau of Standards authority on electroplating, revealed in an address before the Franklin Institute in Philadelphia.

Not more than four ten-thousandths of an inch thickness of chromium metal is used as the protective coating on rifle and machine gun barrels at Frankford Arsenal, Philadelphia, and on six-inch guns at Washington Navy Yard.

Dr. Blum predicted that chromium-plating for wear resistance would be more extensively utilized in the near future. Chromium aids the manufacture of both paper and metallic money. Printing plates from which all United States paper currency and postage stamps are printed are chromium-coated, while some dies used in stamping coins at the Philadelphia Mint are made to last longer by chromium coats. Other applications of chromium include tools for cutting soft but abrasive materials, dimensional gages, electrotypes, piston pins, machine parts, etc.

Electro-deposition of platinum metals and tungsten promise to meet new problems of industry in the near future, Dr. Blum said.

Science News Letter, November 14, 1931

ETHNOLOGY

November Meteors Were Dead Souls to Mexicans

BEFORE the first Europeans came to America, the Mexicans knew the meteors in the skies that display themselves every autumn. They called them "falling hairs," and believed they were souls making their annual visit to earth with the Lord of the Dead. They commemorated the showers each year by "quecholli" festivals about the end of October. The festivals and the shooting stars were associated with the end of the world.

Stansbury Hagar, enthnologist of the Brooklyn Institute, finds evidence in an ancient Aztec code, that the "falling hairs" were the familiar November meteors with their fiery trails behind them. Mexicans as well as Mayas appear to have distinguished between various meteor groups.

At Acancéh, Mayan city in northern Yucatan, an Indian Zodiac is identified by Mr. Hagar in stucco decorations on the facade of a pyramid. Astronomical signs in regular sequence show Taurus and the Pleiades. A down-flying half-human figure with star-symbols in his tail and arrows over his head, Mr. Hagar believes, is a Taurid meteor emanating from Taurus in November near the meridian.

Science News Letter, November 14, 1931

MEDICINE

After-Care of Paralysis Victims Strongly Urged

THE NEED for adequate after-care of the pathetic victims of the recent infantile paralysis outbreak is being urged by the Medical Society of the County of Kings, Brooklyn, N. Y. A special committee on after-care of this disease is now at work in cooperation with the Visiting Nurse Association and the medical profession generally to see that this important feature of the treatment of the disease is not neglected.

The after-care of these small patients is aimed to prevent as far as possible the distressing deformity and crippling which this devastating disease almost always leaves in its wake. While much may be done along these lines, the work must be carried out under expert guidance and for a long period of time.

"The outstanding duty of the health authorities and of the medical profession lies in warning the public that there is no panacea," the medical society has declared. "Irreparable damage can be done by the over-stimulation of muscles and by other improper handling. Finally, early neglect may result in deformity which could have been prevented."

The bulk of the patients in the last epidemic came from homes where after-care at private fees would not be possible, the society's committee on public health found. Many patients were from families which under normal conditions would have difficulty in affording the type of after-care required.

Science News Letter, November 14, 1931

MATHEMATICS

Mathematics May Hold Key to Quantum Theory

THAT the lumpiness of energy may be explained on purely mathematical grounds was suggested to the meeting of the American Mathematical Society at Columbia University by Prof. Edward Kasner of Columbia, as a result of his studies of curves.

An imaginary or complex mathematical curve, Prof. Kasner said, has a peculiarity that a piece of it can never be made like a straight line no matter how short a piece is taken. Prof. Kasner studied the ratio between the length of a straight line cutting such a curve when the length of the piece cut off is made smaller and smaller, and found some curious things.

In ordinary curves this ratio is one but in the special cases considered by him the ratio can have only discontinuous values less than one, such as 0.94, 0.86, 0.80, etc. These values become realized when electrons are assumed to shoot out with the velocity of light and measurements are made in the space of Minkowski and Einstein.

Jerkiness of this kind reminds one of the things observed in the quantum theory. Prof. Kasner suggested that there may be some relation between the mathematical fact and the physical quantum laws.

Science News Letter, November 14, 1931

PHYSICS

Long Pipe Lines Unhurt By Stray Electricity

STRAY ELECTRIC currents from street car tracks may travel along nearby pipe lines and hasten their corrosion, but the currents which follow long oil and gas pipe lines for miles and miles do not speed up rusting and leaking. This is the conclusion of Stanley Gill and W. F. Rogers, research engineers with the Gulf Oil Companies, following a study reported in *Physics*.

It is well known that currents from electric railways often jump to nearby pipe lines and rapidly destroy the pipe. But the currents Mr. Gill and Mr. Rogers studied are found in pipe lines far from electric railways or other sources of stray currents and frequently follow the pipe for miles without getting larger or smaller. They called these "long line currents."

Science News Letter, November 14, 1931

MEDICINE

Lister's Antiseptic Treatment

"A Classic of Science"

Lister's Methods Paved the Way for Modern Asepsis and Banished Hospital Gangrene, Once Almost Unavoidable

ON A NEW METHOD OF TREATING COMPOUND FRACTURE, ABSCESS, ETC., with observations on the conditions of suppuration. By Joseph Lister. In The Lancet, London, 1867.

THE frequency of disastrous consequences in compound fracture, contrasted with the complete immunity from danger to life or limb in simple fracture, is one of the most striking as well as melancholy facts in surgical practice.

If we inquire how it is that an external wound communicating with the seat of fracture leads to such grave results, we cannot but conclude that it is by inducing, through access of the atmosphere, decomposition of the blood which is effused in greater or less amount around the fragments and among the interstices of the tissues, and, losing by putrefaction its natural bland character, and assuming the properties of an acrid irritant, occasions both local and general disturbance.

We know that blood kept exposed to the air at the temperature of the body, in a vessel of glass or other material chemically inert, soon decomposes; and there is no reason to suppose that the living tissues surrounding a mass of extravasated blood could preserve it from being affected in a similar manner by the atmosphere. On the contrary, it may be ascertained as a matter of observation that, in a compound fracture, twenty-four hours after the accident the coloured serum which oozes from the wound is already distinctly tainted with the odour of decomposition, and during the next two or three days, before suppuration has set in, the smell of the effused fluids becomes more and more offensive.

This state of things is enough to account for all the bad consequences of the injury.

The pernicious influence of decomposing animal matter upon the tissues has probably been underrated, in consequence of the healthy state in which granulating sores remain in spite of a very offensive condition of their discharges. To argue from this, however, that fetid material would be innocuous in a recent wound would be to make a great mistake. The granulations being composed of an imperfect form of tissue, insensible and indisposed to absorption, but with remarkably active cell-development, and perpetually renovated as fast as it is destroyed at the surface, form a most admirable protective layer, or living plaster. But before a raw surface has granulated, an acrid discharge acts with unrestrained effect upon it, exciting the sensory nerves, and causing through them both local inflammation and general fever, and also producing by its caustic action a greater or less extent of sloughs, which must be thrown off by a corresponding suppuration, while there is at the same time a risk of absorption of the poisonous fluids into the circulation.

Strikingly Corroborated . . .

This view of the cause of the mischief in compound fracture is strikingly corroborated by cases in which the external wound is very small. Here, if the coagulum at the orifice is allowed to dry and form a crust, as was advised by John Hunter, all bad consequences are probably averted, and, the air being excluded, the blood beneath becomes organized and absorbed, exactly as in a simple fracture. But if any accidental circumstance interferes with the satisfactory formation of the scab, the smallness of the wound, instead of being an advantage, is apt to prove injurious, because, while decomposition is permitted, the due escape of foul discharges is prevented. Indeed, so impressed are some surgeons with the evil which may result from this latter cause, that, deviating from the excellent Hunterian practice, they enlarge the orifice with the knife in the first instance and apply fomentations, in order to mitigate the suppuration which they render inevitable.

Turning now to the question how the atmosphere produces decomposition of organic substances, we find that a flood of light has been thrown upon this most important subject by the philosophic researches of M. Pasteur, who has demonstrated by thoroughly convincing evidence that it is not to its oxygen or to any of its gaseous constituents that the air owes this property, but to minute particles suspended in it, which are the germs of various low forms of life, long since revealed by the microscope, and regarded as merely accidental concomitants of putrescence, but now shown by Pasteur to be its essential cause, resolving the complex organic compounds into substances of simpler chemical constitution, just as the yeast plant converts sugar into alcohol and carbonic acid.

A beautiful illustration of this doctrine seems to me to be presented in surgery by pneumothorax with emphysema, resulting from puncture of the lung by a fractured rib. Here, though atmospheric air is perpetually introduced into the pleura in great abundance, no inflammatory disturbance supervenes; whereas an external wound penetrating the chest, if it remains open, infallibly causes dangerous suppurative pleurisy. In the latter case the blood and serum poured out into the pleural cavity, as an immediate consequence of the injury, are decomposed by the germs that enter with the air, and then operate as a powerful irritant upon the serous membrane. But in case of puncture of the lung without external wound, the atmospheric gases are filtered of the causes of decomposition before they enter the pleura, by passing through the bronchial tubes, which, by

HOW IT FEELS
to be in an
Earthquake
And How Earthquake Waves Travel, Will be Described by
CLARENCE E. DUTTON
in the next
CLASSIC OF SCIENCE

their small size, their tortuous course, their mucous secretion, and ciliated epithelial lining, seem to be specially designed to arrest all solid particles in the air inhaled. Consequently the effused fluids retain their original characters unimpaired, and are speedily absorbed by the unirritated pleura.

Applying these principles to the treatment of compound fracture, bearing in mind that it is from the vitality of the atmospheric particles that all the mischief arises, it appears that all that is requisite is to dress the wound with some material capable of killing these septic germs, provided that any substance can be found reliable for this purpose, yet not too potent as a caustic.

Was Much Struck . . .

In the course of the year 1864 I was much struck with an account of the remarkable effects produced by carbolic acid upon the sewage of the town of Carlisle, the admixture of a very small proportion not only preventing all odour from the lands irrigated with the refuse material, but, as it was stated, destroying the entozoa which usually infest cattle fed upon such pastures.

My attention having for several years been much directed to the subject of suppuration, more especially in its relation to decomposition, I saw that such a powerful antiseptic was peculiarly adapted for experiments with a view to elucidating that subject, and while I was engaged in the investigation the applicability of carbolic acid for the treatment of compound fracture naturally occurred to me.

My first attempt of this kind was made in the Glasgow Royal Infirmary in March, 1865, in a case of compound fracture of the leg. It proved unsuccessful, in consequence, as I now believe, of improper management; but subsequent trials have more than realized my most sanguine anticipations.

Carbolic acid[1] proved in various ways well adapted for the purpose. It exercises a local sedative influence upon the sensory nerves; and hence is not only almost painless in its immediate action on a raw surface, but speedily renders a wound previously painful entirely free from uneasiness. When employed in compound fracture its caustic properties are mitigated so as to be unobjectionable by admixture with the blood, with which it forms a tenacious mass that hardens into a dense crust, which long retains its antiseptic virtue, and has also other advantages, as will appear from the following cases, which I will relate in the order of their occurrence, premising that, as the treatment has been gradually improved, the earlier ones are not to be taken as patterns.

CASE 1.—James G——, aged eleven years, was admitted into the Glasgow Royal Infirmary on the 12th of August, 1865, with compound fracture of the left leg, caused by the wheel of an empty cart passing over the limb a little below its middle. The wound, which was about an inch and a half long, and three-quarters of an inch broad, was close to, but not exactly over, the line of fracture of the tibia. A probe, however, could be passed beneath the integument over the seat of fracture and for some inches beyond it. Very little blood had been extravasated into the tissues.

My house surgeon, Dr. Macfee, acting under my instructions, laid a piece of lint dipped in liquid carbolic acid upon the wound, and applied lateral pasteboard splints padded with cotton wool, the limb resting on its outer side, with the knee bent. It was left undisturbed for four days, when the boy complaining of some uneasiness, I removed the inner splint and examined the wound. It showed no signs of suppuration, but the skin in its immediate vicinity had a slight blush of redness. I now dressed the sore with lint soaked with water having a small proportion of carbolic acid diffused through it; and this was continued for five days, during which the uneasiness and the redness of the skin disappeared, the sore meanwhile furnishing no pus, although some superficial sloughs caused by the acid were separating. But the epidermis being excoriated by this dressing, I substituted for it a solution of one part of carbolic acid in from ten to twenty parts of olive oil, which was used for four days, during which a small amount of imperfect pus was produced from the surface of the sore, but not a drop appeared from beneath the skin. It was now clear that there was no longer any danger of deep-seated suppuration, and simple water dressing was employed. Cicatrization proceeded just as in an ordinary granulating sore. At the expiration of six weeks I examined the condition of the bones, and, finding them firmly united, discarded the splints; and two days later the sore was entirely healed, so that the cure could not be said to have been at all retarded by the circumstance of the fracture being compound.

JOSEPH, LORD LISTER

when he was a young surgeon with the revolutionary idea that wounds need not become infected.

This, no doubt, was a favorable case, and might have done well under ordinary treatment. But the remarkable retardation of suppuration, and the immediate conversion of the compound fracture into a simple fracture with a superficial sore, were most encouraging facts.

Case 2. Patrick F——

CASE 2.—Patrick F——, a healthy labourer, aged thirty-two, had his right tibia broken on the afternoon of the 11th of September, 1865, by a horse kicking him with its full force over the anterior edge of the bone about its middle. He was at once taken to the infirmary, where Mr. Miller, the house surgeon in charge, found a wound measuring about an inch by a quarter of an inch, from which blood was welling profusely.

He put up the fracture in pasteboard splints, leaving the wound exposed between their anterior edges, and dressing it with a piece of lint dipped in carbolic acid, large enough to overlap the sound skin about a quarter of an inch in every direction. In the evening he changed the lint for another piece, also dipped in carbolic acid, and covered this with

[1]Carbolic acid is found in the shops in two forms—the glacial or crystalline, solid at ordinary temperatures of the atmosphere; and the fluid, which sometimes passes under the name of German creosote. The fluid variety is sold in various degrees of purity. The crude forms are objectionable from their offensive odour; but the properly rectified product is almost fragrant. Different samples, however, differ much in energy of action, and hence, though I have hitherto employed the liquid kind in compound fracture, it would probably be better to use the crystallized form, melting it by placing the vessel containing it in warm water for a few minutes. Carbolic acid is almost absolutely insoluble in water, but dissolves readily in various organic liquids, such as the common fixed oils or glycerine.

oiled paper. I saw the patient next day, and advised the daily application of a bit of lint soaked in carbolic acid over the oiled paper; and this was done for the next five days. On the second day there was an oozing of red fluid from beneath the dressing, but by the third day this had ceased entirely. On the fourth day, when, under ordinary circumstances, suppuration would have made its appearance, the skin had a nearly natural aspect, and there was no increase of swelling, while the uneasiness he had previously felt was almost entirely absent. His pulse was 64, and his appetite improving. On the seventh day, though his general condition was all that could be wished, he complained again of some uneasiness, and the skin about the still adherent crust of blood, carbolic acid, and lint was found to be vesicated, apparently in consequence of the irritation of the carbolic acid. From the seventh day the crust was left untouched till the eleventh day, when I removed it, disclosing a concave surface destitute of granulations, and free from suppuration. Water dressing was now applied, and by the sixteenth day the entire sore, with the exception of one small spot where the bone was bare, presented a healthy granulating aspect, the formation of pus being limited to the surface of the granulations.

I now had occasion to leave Glasgow for some weeks, and did so feeling that the cure was assured. On my return, however, I was deeply mortified to learn that hospital gangrene attacked the sore soon after I went away, and made such havoc that amputation became necessary.

Perfectly Conclusive . . .

While I could not but feel that this case, by its unfortunate issue, might lose much of its value in the minds of others, yet to myself it was perfectly conclusive of the efficacy of carbolic acid for the object in view. At the same time it suggested some improvement in matters of detail. It showed that the acid may give rise to a serous exudation apt to irritate by its accumulation, and therefore that a warm and moist application would be advantageous to soothe the part, and also ensure the free exit of such exuded fluid. At the same time it appeared desirable to protect the crust with something that would retain the volatile organic acid more effectually than oiled silk or gutta-percha, through which it makes its way with the utmost facility. For this purpose a metallic covering naturally suggested itself, and as ordinary tin-foil is unsuitable from its porosity, I employed thin sheet-lead, and afterwards block-tin, such as is used for covering the jars of anatomical preparations, superior to lead on account of the facility with which it can be moulded to any shape that is desired.

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PHYSICS

Physicists Study Effects of Strong Winds on Skyscrapers

Tests Made With Building Model in Wind Tunnel To Determine the Safety of America's Giant Structures

See Front Cover

ANOTHER official government investigation is getting under way in Washington. The men involved in the new probe are studying a problem of vital concern to every city in America.

The investigators working now are scientists, and their problem is to find out whether skyscrapers—including the ten and twenty story skyscrapers of the average American city—are safe. The government is anxious to know if giant structures give adequate protection to the thousands of people who work within their lofty walls.

One key question the probing scientists seek an answer to is: Just what is the effect of terrific winds on skyscrapers—winds that often make the tallest buildings sway?

In charge of Uncle Sam's investigation, the only government skyscraper probe ever attempted, is the U. S. Bureau of Standards, with a capable staff of technical experts equipped with unique new instruments.

Scientists, led by Dr. H. L. Dryden, authority on aerodynamics for the Bureau of Standards, have already launched their research program. They have acquired a miniature model of the titanic Empire State building, which is being tested under various conditions of wind velocity. A picture of the model appears on the front cover of this issue of the SCIENCE NEWS LETTER.

Under the guidance of the American Institute of Structural Steel, a series of tubes have been installed in the four faces in the outside walls of the actual Empire State building at three different floor levels—the 36th, the 55th and the 75th. Attached to pressure-recording devices, these tubes measure approximately the wind pressure and suction on the building. The location of the instruments is such that while pressure is being measured on the windward side of the building, the pull from the partial vacuum is being recorded on the leeward side.

Dr. Dryden tells just how Uncle Sam goes about checking up his model tests with the actual measurements being conducted on the full size structure. He says:

Saving for Builders

"Our model was put in the ten-foot wind tunnel so that we could measure pressure conditions and wind speed at the same places on the model's surface that are being measured on the building itself. Experience in wind tests has taught us that the corresponding pressures and speeds ought to be substantially the same. If this is so, builders of great skyscrapers of the future will not need to go to the expense, trouble and labor of putting wind and sway measuring instruments in the buildings at strategic points. For models will do the work quicker, cheaper and more efficiently.

"However," Dr. Dryden continues, "in this connection it should be borne in mind that our government is not testing the strength of the model under examination, but is simply measuring the effect and force of the wind on the model. We can simulate wind conditions in our wind tunnel up to 70 miles an hour.

"We fastened the model securely in the wind tunnel and measured the pressure at a number of widely distributed pressure holes for different wind speeds and wind directions. We also attached the model to suitable balances and measured the overturning moment and its point of application."

Science News Letter, November 14, 1931

This is the reason for this remarkable book

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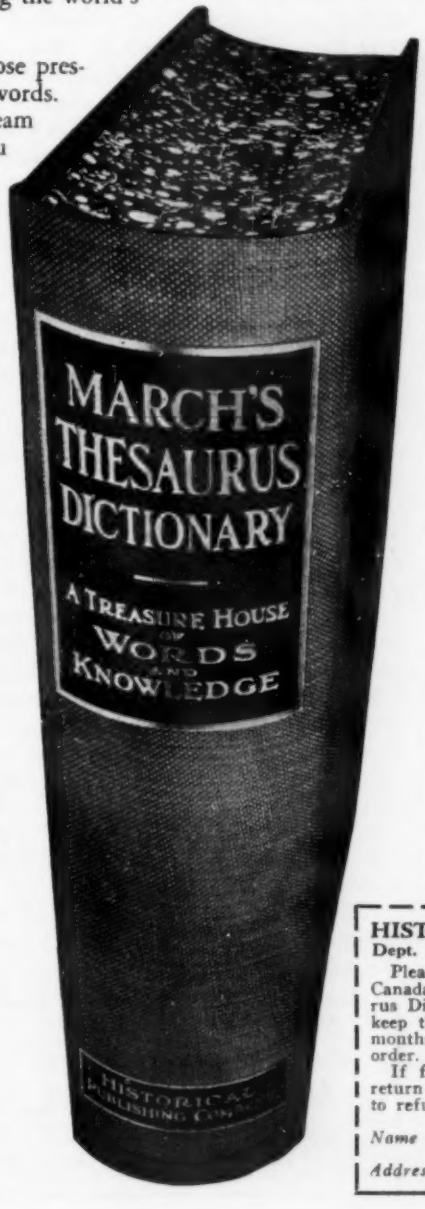

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ASTRONOMY

Earth and Sister Planets Born When Star Ran into Sun

Collision Theory Favored by Dutch "Universe Maker" As Most Plausible Explanation of Solar System

THE EARTH and its sister planets were born when, ages ago, the sun was struck a glancing blow by a passing star, Prof. Willem de Sitter, Dutch astronomer and "universe maker," affirmed in an address to the Washington Academy of Sciences and the Society of Sigma Xi.

An actual collision between the wandering star and the sun instead of a near approach is favored by Prof. de Sitter as the most plausible explanation of the way in which the sun obtained its whirling family of satellites. Dr. Harold Jeffreys, British scientist, suggested this collision theory of the planetary system's origin, in order to explain the way in which the sun and the planets rotate on their axes. The idea that the planets were thrown out of the body of the sun by the attraction of another celestial body passing at a very short distance dates back to 1861. Prof. de Sitter declared that the Laplacean nebular hypothesis that held sway for over a century has now yielded to the collision theory of the solar system's origin.

"The first result of an encounter would be that a filament of matter was drawn out from the sun towards the passing star," Prof. de Sitter said. "This filament, after the star had passed away, would break up into different fractions some of which would be large and constitute the planets, while a considerable part of the mass of the filament would either fall back on to the sun or be dissolved into a medium of gaseous molecular constitution, which would in the course of time partly fall down on the sun and planets and partly be diffused into space.

"The effect of this medium on the motion of the planets would be to make the orbits circular as the result of friction. Those parts which would fall back on the sun would impart to the sun the momentum acquired from the passing star and thus produce the rotation of the sun in the same direction as the revolution of all the planets. The orbits of the planets would be very elliptical in the beginning and only be reduced to circles gradually due to the effect of the resisting medium and only at first perihelion passage in the elliptical orbit, the satellites would be drawn out from the planet by the action of the sun in the same way as the planets were drawn out from the sun by the star."

Prof. de Sitter contended that this theory explains all the major features of the solar system, leaving only one difficulty, which assuming that the star actually collides with the sun does explain. The actual collision would produce the rotation of the sun and the planets.

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PHYSICS

Speeding Electrons Make Large Molecules Form

BY SHOOTING high speed electrons into vapors of various organic substances, some new substances with large molecules than the original ones have been formed at the University of Toronto by Prof. J. C. McLennan and Dr. W. L. Patrick.

Grain alcohol, methyl alcohol, formaldehyde, acetaldehyde and acetone, simple organic substances, were used in these experiments. Gaseous hydrogen, methane and carbon dioxides were formed by the later decomposition of the yellow complex compounds formed under the direct action of the rays.

The initial clumping process, called "condensation" by chemists, is expected to assist in solving new problems of the structure of chemical compounds. Similar complex substances have already been formed by exposing organic vapors to the bombardment of radium gamma rays.

Science News Letter, November 14, 1931

BOTANY

Nature Ramblings

By FRANK THONE

Late Violets

THE long, mild autumn which we have enjoyed over practically the whole of the country will without much question make it possible for November wood rovers to find May flowers in bloom. And unless winter sleet and snow fall too heavily it may be possible to turn out violets from under the shelter of dry leaves every month until spring comes again.

Winter violets seem more or less miraculous, but as a matter of fact they are quite natural, and really only to be expected when we have spring weather in the fall. Flower buds of perennial plants, whether they are woody trees and shrubs or whether they store their reserve food under ground as violets do, are almost always made up in advance. As soon as the season's leaves are unfolded in the spring, buds providing leaves and flowers for the subsequent season begin to develop at the bases of their stems, and by the time autumn comes these buds are finished and sealed up inside their protective covering of scales. Everything the plant will wear next spring is already there in miniature. All that is needed to start the unfolding process is proper warmth and proper moisture. If this happens to come in the fall rather than at its proper time six months later, it makes no difference to the plant. Violets do not run by calendar. They respond automatically when the proper stimuli reach them.

It is not remarkable, either, that they should bloom in the dead of winter, when the ground may be frozen under their roots. The warmth need not be general; so long as it reaches the buds and the little nub of stored food at the "crown" of the plant, that is enough to set things going. And the slightest surface thaw may easily suffice for that.

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Anatomy

EVOLUTION OF FACIAL MUSCULATURE AND FACIAL EXPRESSION—Ernst Huber—*John Hopkins Press,* 184 p., $2.50. This fascinating book sums up 28 years of research by the author and may be considered a classic on the subject. While the first part will be limited to scientific readers because of its technicalities, the last two chapters are relatively free from scientific terms and will surely interest the general reader. The style throughout is unusually readable and pleasing for a book of this type, and the illustrations from drawings by the author are remarkable. There is an extensive bibliography.

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Microscopy

RECENT ADVANCES IN MODERN MICROSCOPY—Edited by A. Piney—*Blakiston,* 260 p., $3.50. Optics, both of the instrument and of the eye that uses it, new technique and discoveries in animal and plant cells, particularly in dividing cells, and some of the new uses for microscopy in medicine, make up this compact summary of the latest news of what's going on under the lens.

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Physics—Engineering

PLASTICITY, A MECHANICS OF THE PLASTIC STATE OF MATTER—A. Nadai, translated by A. M. Wahl—*McGraw-Hill,* 349 p., $5. This translation from a splendid German text is the first of the "Engineering Societies Monographs" published under the auspices of four national engineering societies. The book, equally valuable for the practicing engineer and the scientific laboratory worker, discusses the flow of metals under stress. It is admirably illustrated. Dr. Nadai is a well known authority in the field, especially in Europe.

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Psychology

THE CRAVING FOR SUPERIORITY—Raymond Dodge and Eugen Kahn—*Yale University Press,* 69 p., $1.50. A small, handy volume in which two prominent authors bring together the viewpoints of psychologist and psychiatrist on a subject of interest to both as well as to every human being. Distinctions are drawn between genuine superiority or inferiority, the feeling of superiority or inferiority which may or may not correspond to fact, the craving for genuine superiority, and finally the craving for a feeling of superiority. It is the last that leads into trouble. Here is good reading and food for thought.

Science News Letter, November 14, 1931

Biography

JAMES CLERK MAXWELL, A COMMEMORATION VOLUME, 1831-1931—Various Authors—*Macmillian,* 146 p., $2.50. Ten illustrious scientists collaborated in producing this volume of short essays for the centenary memorial celebration of the great Scottish physicist of the last century. They are J. J. Thomson, Max Planck, Albert Einstein, Sir Joseph Larmor, Sir James Jeans, William Garnett, Sir Ambrose Fleming, Sir Oliver Lodge, Sir R. T. Glazebrook and Sir Horace Lamb. While there is little new bibliographical material here, interesting interpretations of some aspects of his life and of the effects of his work on his contemporaries are given. Planck's essay on Maxwell's influence in Germany and Jeans' on Maxwell's method are particularly good.

Science News Letter, November 14, 1931

Exploration

TOLD AT THE EXPLORERS CLUB—Edited by F. A. Blossom—*A. and C. Boni,* 425 p., $3.50. Thirty-three gentlemen adventurers take turns at relating the feats they have done and the wonders they have seen. With such names as Stefansson, Lindbergh and Wilkins on the roster, the evening is certain not to be a dull one.

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Archaeology

EXPLORATIONS IN NORTHEASTERN ARIZONA—Samuel James Guernsey—*Peabody Museum, Harvard Univ.,* 123 p., 66 pl., $2.25. Mr. Guernsey being one of the leading exponents of the old Basket Maker Indian culture, his reports are awaited with interest. This one, which deals with field work done in 1920 to 1923, concerns itself especially with the Post-Basket Maker period, the last days of the culture. The author explains that he was searching primarily for stratified sites, which might supply sure evidence of chronological relations. Hence, the report does deal to some extent with five successive stages of Southwestern culture, from the second phase of the Basket Makers through the third phase of the Pueblos.

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Astronomy-Mathematics

JOHANN KEPLER, 1571-1630—History of Science Society—*Williams & Wilkins,* 133 p., $2.50. The Kepler Tercentenary Memorial celebration held at the Cleveland meeting of the American Association for the Advancement of Science last December appears in print as a valuable reminder of a most interesting man. Kepler the astronomer is described by Dr. W. Carl Rufus of the University of Michigan, Kepler the mathematician by Dr. D. J. Struik of Massachusetts Institute of Technology, Kepler the mystic by Dr. E. H. Johnson of Kenyon College. An excellent bibliography of Kepler's original works and commentaries upon them compiled by Frederick E. Brasch of the Library of Congress completes the book.

Science News Letter, November 14, 1931

Meteorology

METEOROLOGY — D. S. Piston — *Blakiston's,* 187 p., $2.50. A compact elementary textbook, designed to be used in a one-semester undergraduate course, or for the personal use of teachers who wish to improve their knowledge of the subject. Mathematics has wisely been kept to a minimum, and all illustrations are maps, graphs and diagrams.

Science News Letter, November 14, 1931

Ecology

ANIMAL ECOLOGY, WITH ESPECIAL REFERENCE TO INSECTS—Royal N. Chapman—*McGraw-Hill,* 464 p., $4. Prof. Chapman here brings into one place the ripe results of his many years of research in animal ecology and of the labors of his colleagues, making a worthy addition to the good list of biological works already offered by his publisher. By concentrating attention on insects and other small, highly motile forms, Prof. Chapman is able to bring statistical method to bear with good effect.

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Child Hygiene

COMMUNICABLE DISEASE CONTROL —Report of the Committee on Communicable Disease Control of the White House Conference—*Century,* 243 p., $2.25. This volume reviews the present methods of communicable disease control, makes recommendations for improving these methods and points out fields where further study is needed.

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